Remarks

Claims 1, 4-10 and 12-19 stand rejected under 35 U.S.C. §103 as being unpatentable over EP '214 and US '780. The Applicants respectfully submit that the cited references do not render the claims obvious. Reasons are set forth below.

Claims 1 and 10 have been amended to recite the amount of C as being 0.006% or less, the amount of Si being 0.02 to 0.13%; the amount of Mn being 2.0% or less; the amount of Cr being 14.87 to 40.0%; the amount of Mo being 0.11 to 5.0%; the amount of Nb being 0.21 to 3.0%. The amount of the at least one element selected from Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Zr, and Hf is 0.03 to 1.0%. The range of Mo/Nb has been amended to be greater than or equal to 0.3 but less than or equal to 9.57. Specific support for the aforementioned amounts may be found in Table 1-1, for example.

Claim 10 has been amended to also add that the annealing and pickling step is performed if required. Support for this step is found on page 12, lns. 7-15 of the originally-filed Specification, for example. Also added is a step of cold rolling the steel material and annealing the steel material. Support for these elements is found on page 13, lns. 10-13 of the originally-filed Specification, for example.

Claims 1 and 10 are amended to recite the specific proportions of the elements that produce a material with excellent electrical conductivity, for example, with an electrical resistance of 30 $m\Omega$ cm^2 or less at 800° C. "Steel Nos." 2 to 12, 40 to 42, 44 and 45 from the Applicants' Specification are examples. The superior electrical conductivity is an important property of the present claims. In this regard, new Claim 20 claims that the metal has an electrical resistance of 30 $m\Omega$ cm^2 or less. Support for this claim is found on page 22, lns. 12-25 of the originally-filed Specification.

The reasons for the aforementioned amendments are as follows. An excess amount of C decreases the amount of Cr which is effective to improve oxidation resistance. Addition of an excessive amount of Si produces SiO_2 and increases electrical conductivity. Oxidation resistance cannot be maintained with an excessively small amount of Cr. Excessively small amounts of Mo and Nb decrease precipitation amounts and oxidation resistance cannot be improved. Excessively small amounts of REM suppress improvement of oxidation resistance. Further, precipitation is controlled by Mo/Nb.

With respect to EP '214, the field of that material is different from that claimed by the Applicants. In the "Field of Invention" section, EP '214, provides "[t]he present invention relates to a Cr-containing steel. In particular, the present invention relates to a soft Cr-containing steel which has both heat resistance and formability and is suitable for members used in high-temperature environments, for example and especially, exhaust pipes of automobiles and motorcycles, outer casing for catalysts, and exhaust ducts in thermal power plants."

In sharp contrast, the Applicants' Claims 1 and 10 recite a metallic material for solid-oxide fuel cells. The Applicants' claims relate to a metallic material for interconnects of solid-oxide fuel cells having oxidation resistance in use at high temperatures and electrical conductivity, a fuel cell using the metallic material, and a method for producing the metallic material. EP '214 does not describe electrical conductivity, which is an important feature of fuel cell material. Also, EP '214 does not specify amounts of precipitates before being used as a separator of a fuel cell to thereby secure stable oxidation resistance. Also, according to the rejection, EP '214 discloses precipitation of an intermetallic compound promoted by Si addition. Nevertheless, in EP '214, the range of Si is specified with an object to suppress the precipitation to secure high-temperature strength. On the other hand, the Applicants' claimed subject matter specifies a fixed precipitation amount of

intermetallic compound. However, in specifying the Si content, importance is attached to the prevention of a harmful influence, namely, the degradation of the electrical conductivity caused by the generation of SiO_2, rather than the importance of the effect of Si. This is different from that disclosed in EP '214. And as provided above, Claims 1 and 10 were amended on the basis of particularly excellent examples. In particular, the range of Si is restricted to unexpectedly excellent characteristics. Furthermore, REM addition, which is indispensable for obtaining the Applicants' properties, is specified in EP '214 to achieve a supplemental effect, and with no-REM added examples, the Applicants' properties are unable to be achieved. Also, for obtaining a high level of the primarily important property of electrical conductivity, the composition has to be adjusted to the range as specified in amended Claims 1 and 10.

In view of what has been discussed above, amended Claims 1 and 10 are technically dissimilar to what is disclosed in EP '214 in terms of objectives and desired properties. In EP '214, there are no Examples that disclose what is recited in amended Claims 1 and 10. For the foregoing reasons, withdrawal of the rejection is respectfully requested.

Further, with respect to US '780, the field of that metal is different from that claimed. US '780 discloses, in column 1, lines 16 to 26 under the heading of Technical Field and Industrial Applicability of the Invention, that

> "the present invention is directed to a ferritic stainless steel alloy having microstructural stability and, mechanical properties making it particularly suited for high temperature applications. Such applications include, but are not limited to, current collecting interconnects in solid oxide fuel cells, furnace hardware, equipment for the chemical process, petrochemical, electrical power generation, and pollution control industries, and equipment for handling molten copper and other molten metals."

Thus, the problem to be solved by US '780, as set forth in column 3, lines 1 to 9, is "a need for an improved stainless steel alloy having high temperature creep resistance, good thermal stability and other characteristics that make it suitable for use as current collecting interconnects in SOFC's and for use in other high temperature applications, such as in equipment for the chemical process, petrochemical, electrical power generation, and pollution control industries, as well as in furnace hardware and equipment for handling molten metals." In other words, US '780 is directed solely to improving high temperature creep resistance.

In sharp contrast, and as provided above, amended Claims 1 and 10 are directed to "a metallic material for solid-oxide fuel cells." In particular, the claimed subject matter "relates to a metallic material for interconnects of solid-oxide fuel cells having oxidation resistance in use at high temperatures and electrical conductivity, a fuel cell using the metallic material, and a method for producing the metallic material." Therefore, even assuming *arguendo* that the claimed metal and the metal of US '780 are used for some of the same purposes, for example, as a metallic material for solid-oxide fuel cells, US '780 does not include any description concerning electrical conductivity which is an important property for a material for fuel cells. Further, US '780 does not disclose amounts of precipitates before being used as a separator of a fuel cell thereby to secure stable oxidation resistance.

To obtain at a high level the electrical conductivity of the Applicants' claims, generation of SiO_2 has to be suppressed. Hence, the Applicants' range of Si content is specified as 0.02 to 0.13% in amended Claims 1 and 10. US '780 does not describe the influence of Si on electrical conductivity and the composition is not changed by adjusting the influence of Si. Therefore, the whole maximum values are outside the range recited in amended Claims 1 and 10. Finally, in US '780 there are no Examples that read on amended Claims 1 and 10.

For the foregoing reasons, the Applicants respectfully submit that amended Claims 1 and 10 are not rendered obvious by US '780. Withdrawal of the rejection is respectfully requested.

In light of the foregoing, the Applicants respectfully submit that the entire Application is now in condition for allowance, which is respectfully requested.

Respectfully submitted,

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